

WHAT IS CLAIMED IS:

1 1. Fiberoptic sensing apparatus, comprising:

2 a fiberoptic coupler in which a plurality of optical
3 fibers are joined through a fused coupling region, said
4 optical fibers including at least one input optical fiber and
5 a plurality of output optical fibers, said fiberoptic coupler
6 distributing light incident to said input optical fiber among
7 said plurality of output optical fibers;

8 a support member;

9 said coupler being mounted to said support member and
10 configured such that at least a portion of said coupling
11 region can be deflected to change the light distribution among
12 said output fibers without putting said coupling region under
13 tension; and

14 a fluid column cooperative with a deflection member
15 disposed to deflect said portion of said coupling region.

1 2. The apparatus of Claim 1, further comprising:

2 a transducer coupled to said fluid column, said
3 transducer converting pressure fluctuations from an external

4 source into pressure changes in said fluid column, causing
5 said deflection member to deflect said portion of said
6 coupling region.

1 3. The apparatus of Claim 2, wherein said transducer is
2 disposed at a first end of said fluid column, and said
3 deflection member is disposed at a second end of said fluid
4 column.

1 4. The apparatus of Claim 3, further comprising:
2 a pressurizing device which sets an initial fluid
3 pressure of said fluid column.

1 5. The apparatus of Claim 4, wherein said pressurizing
2 device is connected to said fluid column at a position between
3 said first and second ends.

1 6. The apparatus of Claim 1, wherein said fluid column
2 is a liquid column.

1 7. The apparatus of Claim 1, wherein said fluid column
2 is a gaseous column.

1 8. The apparatus of Claim 1, wherein at least part of
2 said fluid column is contained in a hose.

1 9. The apparatus of Claim 2, wherein at least part of
2 said fluid column is contained in a hose.

1 10. The apparatus of Claim 1, further comprising:
2 a device optically coupled to said output optical fibers
3 to detect the change of light distribution.

1 11. The apparatus of Claim 10, further comprising:
2 a display connected to an output of said device.

1 12. An apparatus for monitoring acoustic activity or
2 motion of an object, comprising:
3 a support member having a surface configured to support
4 the object;

5 a transducer associated with said support member and
6 capable of transmitting pressure fluctuations due to acoustic
7 activity or motion of the supported object;

8 a fiberoptic sensor having a fused-fiber coupling region
9 supported such that at least a portion of said coupling region
10 can be deflected to change an output of said sensor without
11 said coupling region being put under tension; and

12 a fluid column coupled to said transducer and cooperative
13 with a deflection member to transmit pressure fluctuations
14 from said transducer to said deflection member, said
15 deflection member deflecting said portion of said coupling
16 region.

1 13. The apparatus of Claim 12, wherein said transducer
2 is disposed at a first end of said fluid column, and said
3 deflection member is disposed at a second end of said fluid
4 column.

1 14. The apparatus of Claim 12, wherein at least a
2 portion of said fluid column is contained in a hose.

1 15. The apparatus of Claim 12, wherein said transducer
2 includes a bladder having an interior space in communication
3 with said fluid column.

1 16. The apparatus of Claim 15, wherein said bladder has
2 a resiliently deformable portion which transmits external
3 pressure fluctuations to said interior space.

1 17. The apparatus of Claim 12, wherein said support
2 member has a recessed or cut-out portion in which at least a
3 portion of said transducer is received.

1 18. The apparatus of Claim 17, wherein said transducer
2 includes a bladder, a portion of which protrudes from said
3 surface of said support member to engage the object to be
4 monitored.

1 19. The apparatus of Claim 18, wherein at least a
2 portion of said fluid column is contained in a hose.

1 20. The apparatus of Claim 19, wherein said support
2 member has a recessed or cut-out portion in which at least a
3 portion of said hose is received.

1 21. The apparatus of Claim 12, further comprising:
2 a device optically coupled to said fiberoptic sensor to
3 detect output changes of said sensor due to the deflection of
4 said portion of said coupling region.

1 22. The apparatus of Claim 21, further comprising a
2 display connected to an output of said device